

CLAIMS

1. In a Java computing environment, a Java Bytecode instruction suitable
5 for execution by an inventive Java virtual machine in said Java computing
environment, wherein said inventive Java Bytecode instruction operates to
retrieve a string representation associated with said Java object, thereby
allowing said string representation to be determined without invoking a Java
method.

10 2. A Java Bytecode instruction as recited in claim 1, wherein said Java
Bytecode instruction further operates to:

pop a reference to said Java Bytecode instruction from the top of an
execution stack;

15 determine a string representation of a field associated with said Java
object; and

push a reference to said string representation of said field on top of
said execution stack.

20 3. A Java Bytecode instruction as recited in claim 1, wherein said Java
Bytecode instruction is executed in an embedded system.

4. A Java virtual machine operating in a Java computing environment, said
Java virtual machine capable of determining a string representation
25 associated with a Java object, wherein said virtual machine determines said
string representation of said Java object without invoking a Java "to_string"
method.

5. Java virtual machine as recited in claim 4, wherein said Java virtual
30 machine executes an inventive Java Bytecode instruction, said inventive
Java Bytecode instruction operating to determine said string representation
associated with said Java object; thereby allowing said string representation
to be determined without invoking a Java method.

6. A Java virtual machine as recited in claim 5, wherein said virtual machine operates to:

pop a reference to said Java Bytecode instruction from the top of an execution stack;

5 determine a string representation of a field associated with said Java object; and

push a reference to said string representation of said field on top of said execution stack.

10 7. A Java virtual machine as recited in claim 5, wherein said Java virtual machine operates in an embedded system.

8. In a Java computing environment, a method of retrieving a string representation for a Java object, said method comprising:

15 receiving an inventive Java Bytecode instruction in a stream of Java Bytecodes suitable for execution by a virtual machine operating in said Java computing environment, and

wherein said inventive Java Bytecode instruction operates to determine said string representation associated with said Java object;

20 thereby allowing said string representation to be determined without invoking a Java method.

9. A method as recited in claim 8, wherein said method further comprises:

popping a reference to a Java object from an execution stack

25 determining a string representation of a field associated with said Java object; and

pushing a reference to said string representation of said field on top of said execution stack.

30 10. A method as recited in claim 7, wherein said method further comprises: pushing a reference to said Java object on said execution stack.

11. A method as recited in claim 8, wherein said pushing of a reference to said Java object is performed by execution of a Java Aload execution.

12. A method as recited in claim 11, wherein said method is performed by a virtual machine.

5 13. A method as recited in claim 12, wherein said virtual machine is operating in an embedded system.

14. A computer readable media including computer program code for retrieving a string representation for a Java object, said computer readable
10 media comprising:

computer program code for receiving an inventive Java Bytecode instruction in a stream of Java Bytecodes suitable for execution by a virtual machine operating in said Java computing environment, and

15 wherein said inventive Java Bytecode instruction operates to determine said string representation associated with said Java object; thereby allowing said string representation to be determined without invoking a Java method.

15. A computer readable media as recited in claim 14, wherein said
20 computer readable media further comprises:

computer program code for popping a reference to a Java object from an execution stack;

computer program code for determining a string representation of a field associated with said Java object; and

25 computer program code for pushing a reference to said string representation of said field on top of said execution stack.

16. A computer readable media as recited in claim 15, wherein said computer readable media further comprises:

30 computer program code for pushing a reference to said Java object on said execution stack.

17. A computer readable media as recited in claim 15, wherein said computer program code for pushing said reference is performed by executing a Java Aload instruction.

5 18. A computer readable media as recited in claim 17, wherein said computer readable media is read by a Java virtual machine.

19. A computer readable media as recited in claim 18, wherein said virtual machine is operating in an embedded system.

10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
200
205
210
215
220
225
230
235
240
245
250
255
260
265
270
275
280
285
290
295
300
305
310
315
320
325
330
335
340
345
350
355
360
365
370
375
380
385
390
395
400
405
410
415
420
425
430
435
440
445
450
455
460
465
470
475
480
485
490
495
500
505
510
515
520
525
530
535
540
545
550
555
560
565
570
575
580
585
590
595
600
605
610
615
620
625
630
635
640
645
650
655
660
665
670
675
680
685
690
695
700
705
710
715
720
725
730
735
740
745
750
755
760
765
770
775
780
785
790
795
800
805
810
815
820
825
830
835
840
845
850
855
860
865
870
875
880
885
890
895
900
905
910
915
920
925
930
935
940
945
950
955
960
965
970
975
980
985
990
995